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much interest to students of Northern antiquities, both published in the 'Memoires de l'Academie Royale des Sciences de Danemark.'

One is a discussion of the remarkable so-called 'silver vase' exhumed in 1891 at Gundestrup. Upon its sides were numerous singular figures in relief, and it has generally passed as an example of old Norse work. This view is disproved by Professor Steenstrup, who shows that without doubt it is part of a series of decorations from some Buddhist temple in northern Asia. His memoir is abundantly supplied with plates and illustrations showing the identity of motives. It probably was a part of the spoils of some ancient raid which by exchange had reached the western shore of the continent.

His second memoir is another study of a similar character, bringing out the relations which in proto-historic times existed between Scandinavia and northern Asia. It is entitled 'Yak-Lungta Bracteaterne,' and contains numerous illustrations of gold bracteates from the two regions, showing the same character of design and workmanship.

D. G. BRINTON.

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SCIENTIFIC NOTES AND NEWS.

ASTRONOMY.

THE February number of the Monthly Notices of the Royal Astronomical Society, copies of which have just been received, contains the annual reports of the directors of the British observatories for the year 1895. Many of these reports are very interesting, and they show that the customary astronomical activity has not decreased. The routine meridian observations and those of comets, etc., have been carried on with the usual success. Nearly all the plates for the astrophotographic catalogue, and some of those for the chart, have been taken at the Greenwich, Cape, Oxford and Sydney observatories. The work of measurement has also made

quite satisfactory progress. We quote the following from the Greenwich report :

"Towards the determination of the right ascensions and declinations of the stars the following steps have been taken : From the right ascensions and declinations given in the catalogues of the *Astronomische Gesellschaft*, 'standard coördinates' have been deduced for all stars on 72 plates which are contained in these catalogues. (By standard coördinates are meant the rectangular coördinates of the stars on the plates.) By a comparison of these with the measured coördinates, plate constants have been determined, from which the standard coördinates of other stars on the plates may be obtained by means of a linear correction, and the right ascensions and declinations deduced by a trigonometrical transformation, if desired. A full account of this, as well as the comparison of thirty overlapping plates, is given in the Monthly Notices, January, 1896."

The above shows that the reduction of the catalogue plates is well under way at Greenwich. The same is true at Oxford, and, as we mentioned in a previous issue, it is also proceeding satisfactorily at Paris and Potsdam. At the Cape considerable measuring has also been done. But the most important announcement from the Cape is as follows :

"The printing in two volumes of 'A Determination of the Solar Parallax and the Mass of the Moon from Observations of Iris, Victoria and Sappho,' is approaching completion. The part of the work referring to the meridian observations of the comparison stars is by Prof. Auwers, that of the discussion of the heliometer observations of Iris by Dr. Elkin."

We have not space to refer to the many details given in the reports of the various observatories. But they are all interesting, and will repay perusal by astronomers. The Society's medal was conferred upon Dr. S. C. Chandler, of Cambridge, Mass., as has already been announced in this journal.

THE *Astronomical Journal* of March 31st contains an article by Prof. Simon Newcomb on the 'Variation of Personal Equation with the Magnitude of the Star Observed.' This is the first attempt to make a general discussion of this rather obscure point for a large number of star

catalogues. It has been known for sometime that the right ascensions of faint stars differ systematically from those of the brighter stars, on account of a peculiar form of personal error in making the observations. Prof. Newcomb now determines the amount of this personality *per magnitude* for twelve of the principal catalogues.

It was not possible to treat the observations of each observer separately, but each catalogue was dealt with as if it were the work of a single observer. The catalogues were compared in pairs. Sixteen such pairs were treated, and for each pair the relative variation of right ascension *per magnitude* was computed. The results so obtained were adjusted so as to get the variation *per magnitude* for each catalogue relatively to the great Paris catalogue. The latter was adopted as a standard of reference because it occurs in a majority of the pairs of catalogues treated.

The relation of the Paris catalogue to the truth could be determined by the aid of the results previously obtained by Gill, Küstner, Boss and Becker. The following remarkable result was reached:

The variation *per magnitude* of the right ascension averaged very nearly one-hundredth of a second of time, no matter whether the observations were made by the eye and ear method or by means of the chronograph.

H. J.

GENERAL.

WE learn from the *Botanical Gazette* that plans for the Hull Botanical Laboratory of the University of Chicago have been completed. The building, of four stories and in addition a large roof greenhouse, will include a library, lecture rooms, laboratories and private research rooms for morphology, physiology and taxonomy. As already stated in this JOURNAL, Prof. John M. Coulter, senior editor of *The Botanical Gazette*, has accepted the head professorship of botany. As, however, the building will not be completed before April, 1897, the botanical staff will not be fully organized until the following autumn. With the present issue the *Gazette* passes into the possession of the University of Chicago. The same editors will remain

in charge and the general plan of the journal will be the same. The editors "wish it to be clearly understood that the *Gazette* is not to be the organ of the botanical department of any university, but that it belongs to all botanists everywhere. Its relation to the University of Chicago is simply to bring it that permanence and possibility of development which the present condition of botanical science demands."

THE annual report of the Secretary of the Geological Society of Washington states that there were held during the year 1895 fourteen meetings of the Society, with an average attendance of 35, exclusive of the meeting at which the annual address of the President, Mr. G. K. Gilbert, was given. 38 communications have been presented during the year, 29 of them being announced upon the programs of the meetings and 9 being offered in the informal half hour. The various communications were presented by 27 different members. There are now 111 active members and 38 corresponding members in the Society.

THE Fort Pitt Street Railway Company of Pittsburg has given \$100,000 for a zoölogical garden at Highland Park.

THE bill reported from the Committee on Coinage, Weights and Measures of the House of Representatives adopting the metric system of weights and measures as the legal standard in the United States has been defeated in a preliminary vote, which stood 80 to 65.

PROF. RAMSAY has in preparation a book which will shortly be published by Macmillan & Co., treating the gases in atmospheric air and especially the discovery and subsequent investigation of Argon.

THE Berlin Academy of Science has elected as corresponding members, M. Poincaré, professor of mathematical physics in Paris, and Dr. G. Neumayer, director of the German *Seewarte*.

THE Director of the Lick Observatory has recently received from the Minister of Foreign Affairs of the United States of Venezuela the diploma and decoration of the order of Bolívar, the Liberator. This order was founded in 1825 by Peru and adopted in 1854 by Venezuela.

It is conferred, in this case, for services to science. Dr. Holden had previously received the decoration of Commander of the Ernestine Order of Saxony (founded in 1690) on the same grounds.

THE Presidency of the Royal College of Physicians of London, regarded as the highest honor that can be conferred on a British physician, will probably be filled by the election of Dr. Wilkes, who in the election of 1893 stood next to the ballot of Sir J. Russell Reynolds, the retiring President.

THE Committee on Agriculture of the House of Representatives has reported favorably the bill creating a special commission on highways, to consist of the Chief of Engineers of the Army, the Director of the Geological Survey, and the Chief of Road Inquiry of the Department of Agriculture. The Commission is to consider, among other things, the best methods for the scientific location of highways on the public domain; the employment of the Geological Survey in the discovery of road materials; the free testing of all road materials offered; the construction of model roads, and instruction in road-making at agricultural colleges and experimental stations.

THE admirable article by Prof. William James, of Harvard University, on 'Is Life Worth Living?' in the October *International Journal of Ethics*, has been republished in book form by S. Burns Weston, Philadelphia.

D. APPLETON & Co. announce for publication a work by Prof. John Trowbridge, of Harvard University, entitled 'What is Electricity?'

THE third International Congress of Dermatology will be held in London from August 4th to 8th inclusive, under the Presidency of Mr. Jonathan Hutchinson.

A SERIES of lectures has been arranged to be given at Berlin by professors of the University during the holidays for schoolmasters and teachers. The course will include lectures on the X-rays by Prof. Goldstein, on the nervous system by Prof. Waldeyer, on metabolism by Prof. Zunz, etc.

WE learn from the *British Medical Journal* that a committee has been formed in Berlin for the celebration of the Jenner centenary on May

14th. Among the members are Prof. Virchow, Prof. R. Koch, Prof. von Leyden, Prof. von Bergmann, Prof. Gerhard, Prof. König and others. The program includes an exhibition of portraits, medals, old and new instruments, writings, etc., bearing upon Jenner's great discovery, and also a festive gathering on the day itself, intended not only 'to honor the benefactor of the universe,' but to protest against the anti-vaccination agitation which is constantly going on.

THE Committee on Agriculture of the Massachusetts Legislature has not yet been able to come to an agreement in regard to the appropriation for the Gypsy Moth Commission. It is understood that four members of the committee favor an appropriation of \$200,000, four \$100,000 and three \$50,000.

THE steam yacht *Blencathra* will carry an excursion party to the arctic regions next summer, visiting Iceland, Greenland and Hudson's Bay.

PROF. JAMES F. KEMP, Columbia University, has consented to become one of the editors of the *Zeitschrift für Praktische Geologie*.

PROF. J. B. CUMMINGS, since 1856 professor of science in Westminster College, died on March 31st.

PROF. B. F. TWEED, from 1855 to 1864 professor of rhetoric and logic in Tuft's College, and later supervisor of schools in Boston, died on April 2d, at the age of eighty-five.

THE anatomist, Dr. P. C. Sappey, died on March 14th, at the age of 86. He was the author of important researches on the respiratory apparatus of birds, on the lymphatics and on other subjects, but is best known for his great work on 'Descriptive Anatomy,' which was begun in 1847 and completed in 1863.

HAVING completed his report on the asphalts and other mineral resources of the Uncompahgre Indian Reservation and vicinity in Utah, based on investigations made last fall at the instance of the Secretary of the Interior, Mr. Geo. H. Eldridge, of the U. S. Geological Survey, has resumed geologic work in Florida and neighboring States, with reference more especially to the phosphate deposits of the region.

THE fourth fascicle of Messrs. Collins, Holden and Setchell's *Phycotheca Boreali-Americana*, has recently been issued, containing Nos. 151 to 200 of this valuable distribution of North American algæ. It is rich in species of the genus *Batrachospermum*.

Nature states that a number of admirers of Prof. Mittag-Leffler, the founder of the *Acta Mathematica*, will shortly present him with a congratulatory address, written in four languages—German, French, Italian and English—and expressing the appreciation of mathematicians of the services he has rendered to their science. It is proposed to present him at the same time with his portrait in oils, and a subscription list has been opened to obtain funds for that purpose. Prof. Appell, 6 rue Le Verrier, Paris, will be glad to receive subscriptions.

PROF. PUTMAN states in the *Harvard Graduates' Magazine* the Peabody Museum has received from the American Antiquarian Society many important archæological and ethnological specimens, among which may be mentioned the bow of a Massachusetts Indian. This bow was taken from an Indian in Sudbury in 1665, and is, so far as can be ascertained, the only authentic Massachusetts Indian bow now extant.

SOME interesting instances of human longevity have been brought to notice of late. Alexander Freeman, now at the Sailor's Snug Harbor, on Staten Island, was born December 22, 1786, and is now 110 years of age. In the Society of the War of 1812 are enrolled 33 veterans of that war, whose average age is ninety-nine years. Fourteen are more than one hundred. William Haines, who fought with the Tennessee militia at the battle of New Orleans, at the age of twenty-six, is still living at the St. Louis Memorial Home, aged 107. Davis Parks, aged 106 years, two months, is at Fowler, Mich. Percy Dyer, 104 years, 3 months, at Belvidere, Ill. Andrew F. McKee, 104 years, at Burlington, Kansas. Four years ago there were 65 names on the veteran list.

IN 'Little Africa,' a suburb of Mobile, Ala., still live a number of native Dahomians, brought over in April, 1859, in the last cargo of slaves imported from Africa. They retain many of the traditions and customs of their native land.

IN the Sunday edition of the New York *Sun* for March 29th Mr. Jeremiah Curtin, formerly of the Bureau of Ethnology, began a series of articles on primitive folk lore collected from the Indians in California, Mexico and Guatemala. He writes first on the traditions of the Uintas, a nation formerly resident on the right bank of the Sacramento from San Francisco Bay to the foot of Mt. Shasta.

THE *Revue Scientifique*, commenting on the proposal for the appointment of a permanent director of scientific work in the United States Department of Agriculture, remarks: "Nous comprenons le désir des personnes éclairées et bien intentionnées qui mettent en avant ce projet, et nous l'approuvons sans réserves; mais nous avons des doutes sur l'issue finale des événements, et ne croyons guère à la prochaine réalisation du pays d'Utopie rêvé par Morus."

ANOTHER chapter is added to our knowledge of quadrivalent lead, by Hutchinson and Pollard, in the March Journal of the Chemical Society. They have re-examined the crystals which form when red lead is dissolved in acetic acid and find their composition to be $\text{Pb}(\text{C}_2\text{H}_3\text{O}_2)_4$ lead tetracetate. The molecular weight obtained by freezing point and boiling point methods agreed with this formula as closely as is usual with the acetates. Water at once decomposes the salt quantitatively into lead dioxide and acetic acid, with hydrochloric acid the unstable lead tetrachlorid is formed, which in the presence of sal ammoniac is precipitated as ammonium plumbi-chlorid, $(\text{NH}_4)_2\text{PbCl}_6$. Lead tetrapropionate is also described. The authors point out the close resemblance of the quadrivalent lead salts to the stannic compounds, and urge the use of the name plumbic oxid in preference to lead peroxid. (It may be questioned if, after all, the widely used name lead dioxide is not preferable to either.) H.

As already announced in this journal, two expeditions will be sent from the United States to Japan to observe the total solar eclipse. The expedition from the Lick Observatory will be under the charge of Prof. Schaeberle, who will be accompanied by Dr. Charles Burckhalter, director of the Shabot Observatory, in Oakland, and Messrs. G. E. Shuey and Louis C.

Masten. The work will be wholly photographic in character. Prof. David P. Todd, who has charge of the Amherst expedition, has already left New York with a party consisting of Mr. and Mrs. Arthur Curtis James, of New York; Mrs. D. Todd, Chief Engineer John Pemberton, U. S. N., who goes with the permission of the Secretary of the Navy; Prof. William P. Gerrish, of Harvard, meteorologist and photographer; E. A. Thompson, of Amherst, the head mechanician, and Dr. Vanderpoel Adriance and Arthur W. Frances, of New York. The party will join the yacht 'Coronet' at San Francisco and will sail to Japan by way of Honolulu. The yacht carries a large number of instruments.

At a postponed hearing on Vivisection before the House Committee of Judiciary of Massachusetts, the proposed legislation against vivisection was opposed by Profs. Bowditch, Theobald Smith and J. J. Putnam, of Harvard University; Prof. Hodge, of Clark University; Prof. Wilcox, of Wellesley College; Prof. Sedgwick, of the Massachusetts Institute of Technology, and others. President Eliot is reported by the *Boston Transcript* to have said that in the last twenty-five years, during which experiments in physiology had been conducted in Harvard, not a single instance of a student bringing any complaint of cruelty against the work done in the physiological laboratories had ever come to the knowledge of the corporation. There was no abuse of vivisection in Massachusetts. The men whom this bill indirectly accused of cruelty to animals were the most humane, merciful, clear-seeing men in the community, devoted, year after year, to the most humane occupation now existing in the world. Their profession showed in their faces, and he appealed to the members of the committee to know whether they thought that the men who had appeared before them could be guilty of the charge implied by the application for such legislation.

In the first essay in his studies in the Theory of Descent, first published in 1875, Weismann discussed seasonal dimorphism in butterflies on the basis of direct experimentation and concluded that "differences of specific value can

originate through the direct action of external conditions of life only;" and that "a periodically recurring change of climate is alone sufficient, in the course of a long period of time, to admit of new species arising from one another." In a recent essay on the same subject (*Neue Versuche zum Saison-Dimorphismus der Schmetterlinge*; Fischer, Jena, 1895), the details are given of fresh experiments and the whole subject is discussed anew with special reference to his constantly expanding views on the 'continuity of the germ-plasm.' The experiments are interesting and carefully recorded, but no theoretical conclusions varying much from those formerly reached are given, except in the distinction he makes between direct seasonal dimorphism and that which is adaptive, when the changes in temperature serve only to open the way to the action of natural selection.

THE third paper in Vol. VIII. of the Bulletin of the American Museum of Natural History is by Dr. J. A. Allen on *Alleged Changes of Color in the Feathers of Birds without Molting*, and is a careful review of the literature on the subject. Dr. Allen makes it plain that much of the so-called 'evidence' of change of color without molt is due to careless examination of specimens, much to a wrong interpretation of facts, and that much is pure assertion without any foundation whatever. Considerable alteration in plumage is brought about by the wearing away of the edges of feathers, slight changes result from bleaching, but while there may be a slight basis in fact for some of the speculations regarding change of color without molt, the cause, in nine cases out of ten, is demonstrably due to molt. 'Intermediate stages' are caused by the fact that a given molt does not affect all individuals of a species alike, but, owing to conditions of food, health, etc., some birds are carried to a more advanced stage than others.

AMONG the lectures to be given at the Royal Institution after Easter are the following: Prof. James Sully, of University College, London, three lectures on 'Child-study and Education;' Mr. C. Vernon Boys, three lectures on 'Ripples in Air and on Water;' Prof. T. G. Bonney, two lectures on 'The Building and Sculpture of Western Europe' (the Tyndall lectures); Prof. Dewar, three lectures on 'Recent Chemical

Progress; Mr. W. Gowland, three lectures on 'The Art of Working Metals in Japan; Dr. Robert Munro, two lectures on 'Lake Dwellings; Mr. E. A. Wallis Budge, of the British Museum, two lectures on 'The Moral and Religious Literature of Ancient Egypt.' The first lecture of the Friday evening course will be by M. G. Lippmann, on 'Color Photography.'

WE learn from the London *Times* that the report of the Meteorological Council for the year ending March 31, 1895, submitted to the President and Council of the Royal Society, has just been issued as a Parliamentary paper. Of the forecasts issued at 8:30 p. m., in the year 1894-1895, the percentage of complete success was 56, of partial success 27, of partial failure 12, and of total failure 6. The average for the ten years from 1885 to 1894 was 51.2 of complete success and 30.7 of partial success. The storm warnings show a percentage of 68.5 of success and 23.5 of partial success. The warnings not justified by subsequent weather were 6 per cent. These figures show a marked improvement on those for the years from 1885 to 1893 inclusive. The hay harvest forecasts show a total percentage of 89 of complete or partial success. The Council express their regret that the experiment of exhibiting, at telegraphic stations in rural districts every afternoon, the daily weather forecasts is not to be repeated. The net expenditure of the Council in 1894-95 was £15,212 0s. 11d., as compared with £15,969, 7s. 6d. in 1893-94. The sum of £1,528 0s. 10d., was paid to the postoffice for services rendered. The income of the Council was £15,300, granted by Parliament, and £721 19s. 6d., received from various other sources.

UNIVERSITY AND EDUCATIONAL NEWS.

MRS. ELIZABETH MARY LUDLOW, the mother of the late Robert Center, has given his estate, valued at \$150,000, to Columbia University for the purpose of endowing the 'Robert Center Fund for Instruction of Music.'

THE Teachers' College, New York, has received from a donor whose name is at present withheld, a gift of \$250,000 to complete the present group of buildings. This will make the value

of the property on Morningside Heights, adjacent to the grounds of Columbia University, about \$1,000,000, and will add greatly to the facilities of the College and of Columbia University, to which it is affiliated.

MR. W. C. McDONALD, whose gift of \$500,000 to McGill University was reported in this journal last week has now given, in addition, \$150,000, to be used in maintaining the engineering and physics building.

THE annual report of President Dwight, of Yale University, for the year 1895, states that gifts to the University during the year have amounted to \$305,301.

THE Senate of Deans of the Catholic University of Washington has decided to establish an Institute of Technology. It is proposed to construct a special building for the purpose.

THE following instructors have been appointed in Harvard University: Charles Montague Bakewell, A. M., in philosophy; James Edwin Lough, A. M., in experimental psychology; Charles Palache, Ph. D., in mineralogy; Robert Jay Forsythe, A. B., in metallurgy and metallurgical chemistry.

BARON EÖTVÖS has been made full professor of experimental physics in the University at Buda-Pesth.

DISCUSSION AND CORRESPONDENCE.

HEREDITY AND INSTINCT (II.)*

IN the earlier paper I argued from certain psychological truths for the position that two general principles recently urged by Romanes for the Lamarckian, or 'inherited habit,' view of the origin of instinct do not really support that doctrine. These two principles are those cited by Romanes under the phrases respectively 'co-adaptation' and 'selective value.' In the case of complex instincts these two arguments really amount to one, *i. e.*, as long as we are talking about the *origin* of instinct. And the one argument is this: that partial co-adaptations in the direction of an instinct are not of selective value; hence instinct could not have arisen by gradual

*Conclusion of paper of same title in *SCIENCE* March 20th.